

I claim:

1           **1.**     A method for maturing and releasing oocytes in a bivalve, said method  
2 comprising the sequential steps of:

3  
4           **(a)** administering to a living, intact bivalve an effective amount of a maturation  
5 stimulus comprising exogenous estrogen or an exogenous estrogen agonist;

6  
7           **(b)** allowing oocytes in the bivalve to mature in response to the maturation stimulus;  
8 wherein substantially more oocytes mature than would mature on average in the  
9 same time in an otherwise identically-situated bivalve that had not been  
10 administered the maturation stimulus;

11  
12       and

13  
14           **(c)** administering to the bivalve an effective amount of a spawning stimulus;  
15 whereby the bivalve releases mature oocytes; wherein substantially more mature  
16 oocytes are released than would be released on average by an otherwise  
17 identically-situated bivalve that had not been administered the spawning stimulus;  
18 wherein the spawning stimulus is selected from the group consisting of exogenous  
19 serotonin, an exogenous serotonin agonist, an exogenous serotonin uptake  
20 inhibitor, heat shock, sperm extract, or other spawning stimulus.

1           **2.**     A method as recited in Claim 1, wherein the bivalve is not killed before the  
2 release of oocytes.

1           **3.**     A method as recited in Claim 2, wherein the bivalve is allowed to rest for a  
2 time after the release of oocytes; and wherein the same method is subsequently applied  
3 again to the same bivalve, to cause a subsequent release of oocytes from the same  
4 bivalve during the same breeding season.

1           **4.**     A method as recited in Claim 3, wherein the subsequent release of oocytes  
2 occurs significantly earlier than a subsequent release of oocytes would occur, on average,  
3 in an otherwise identically situated bivalve that is not treated in accordance with the recited  
4 method.

1           **5.**     A method as recited in Claim 2, wherein the bivalve is allowed to rest for a  
2 time after the release of oocytes; and wherein the same method is subsequently applied  
3 again to the same bivalve, to cause a subsequent release of oocytes from the same  
4 bivalve during different breeding seasons.

1           **6.**     A method as recited in Claim 1, wherein the matured oocytes are released  
2 substantially in synchrony.

1           **7.**     A method as recited in Claim 1, wherein the bivalve is a triploid.

1           **8.**     A method as recited in Claim 1, wherein the bivalve is a tetraploid.

1           **9.**     A method as recited in Claim 1, wherein the bivalve is a female.

1           **10.**    A method as recited in Claim 1, wherein the bivalve has an indifferent gonad;  
2 wherein said method additionally induces the bivalve to develop as a female.

1           **11.**    A method as recited in Claim 1, wherein the bivalve is a hermaphrodite.

- 1           **12.**   A method as recited in Claim 1, wherein the bivalve is *Crassostrea virginica*.
- 1           **13.**   A method as recited in Claim 1, wherein the bivalve is *Crassostrea gigas*.
- 1           **14.**   A method as recited in Claim 1, wherein the bivalve is *Patinopecten*  
2 *yessoensis*.
- 1           **15.**   A method as recited in Claim 1, wherein said method causes the bivalve to  
2 release oocytes outside of the normal breeding season.
- 1           **16.**   A method as recited in Claim 1, wherein the maturation stimulus comprises  
2 estradiol-17 $\beta$ ; and wherein the spawning stimulus comprises serotonin.
- 1           **17.**   A method as recited in Claim 1, wherein the spawning stimulus comprises  
2 fluvoxamine.
- 1           **18.**   A method as recited in Claim 1, wherein the spawning stimulus comprises  
2 treatment with heat shock or sperm extract.
- 1           **19.**   A method as recited in Claim 1, wherein the maturation stimulus is  
2 administered to the bivalve in a single dose.
- 1           **20.**   A method as recited in Claim 1, wherein the maturation stimulus is  
2 administered to the bivalve in sequential doses over a period of time, wherein the  
3 sequential doses may be constant or may increase over time.

1           **21.**    A method as recited in Claim 1, wherein the spawning stimulus comprises  
2   a serotonin agonist.

1           **22.**    A method as recited in Claim 1, wherein the spawning stimulus comprises  
a serotonin uptake inhibitor.

1           **23.**    A method as recited in Claim 1, wherein the maturation stimulus comprises  
2   an estradiol-17 $\beta$  agonist.